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ABSTRACT

The basic understandings that could be used to develop a foundation for holistic literacy are discussed. One way to establish this foundation for primary students is by developing understandings of science process skills using the elements and vocabulary of visual literacy. By providing opportunities to integrate oral and visual skills and hands-on experiences using vocabulary not usually associated with the reading of picture books, educaters have the opportunity to reinforce the perceptions young children already have that adults view the world in a holistic fashion. Developing visual understanding is important to developing the links that reach toward holistic literacy. By incorporating additional curricular information with the shared reading experience, teachers can increase children's exposure to literature and reinforce concepts that promote critical thinking and an appreciation of the visual world. A sample list of books and ideas for blending the development of science process skills with visual literacy concepts is included. (Contains 18 references.) (SLD)

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Visual Literacy, Science Process Skills, and Children's Books

by
Beth A. Weigmann

Today's educators are faced with difficult instructional challenges. Schools throughout the nation are plagued with financial woes, multiple ethnic backgrounds of students, and children who suffer from neglect. Against this dreary backdrop teachers in elementary schools throughout the country are rising up to create learning environments that encourage children within a strong supportive social framework. Teachers and children are creating meaning together through shared opportunities for learning. Through cooperative learning groups children are learning to build their own meaning and understandings with the support of all in the class. Rather than creating dull chain links that are weakened by open space children are encouraged to build strong serpentine like links that are interconnected and strong. By learning to combine the links children begin to forge understandings that are rich in context and meaning.

Engaging students in meaningful activities becomes an ever increasing challenge in a world filled with competing images, bright colors, and an ever-quickening pace. Yet teachers find children responding favorably to opportunities to work together on problems, develop their own questions, and then find the answers to those questions. Providing opportunities to engage in meaningful reflective activity appears to outweigh faster, quicker, and brighter when it comes to learning.

A dramatic shift is taking place within elementary education. Teachers are shifting toward an integrated "whole" approach to instruction.

Spelling is placed within the context of the need to use the common spellings so that others will understand. Reading is for meaning and pleasure not just to get to the end of the read book with a list of new sight words. Mathematics is for solving problems that may be more practical in nature. Science is for helping develop understandings about the world around us. And the spoken word is for sharing our thoughts and ideas with others.

John Dewey (1916, p. 21-26) was certainly an advocate of this form of instruction. He encouraged teachers to plan instruction that involved interesting activities requiring physical activity, mental challenge, and collaboration. Dewey perceived the educational challenge as one requiring instruction that engaged the whole child. Kohl (as cited in Hassard, 1975, p. 57) defined wholeness as "being aware of and in harmony with the different components of one's existence." By providing holistic

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instruction we help children put learning in context and strengthen their understandings and progress toward becoming literate citizens.

According to Hassard (1985, p. 53) most teachers would agree that targeting the development of literate persons is a primary goal of education. "Literate persons have a substantial knowledge base with sufficient conceptual network and process skills to enable quick learning, logical thought and an appreciation of aesthetic values" (Hassard, 1985, p. 53). Developing cross content understandings helps to build the blocks necessary for broader literacies to develop. By combining literacies developed through visual literacy, science process skills, critical thinking/ problem-solving skills, and the reading of picture books professionals will make giant strides toward developing holistic literacy. Holistically literate persons are able to use skills from several disciplines at once to facilitate understandings, imagine new solutions to age-old problems, or create new images to communicate with others.

This discussion will center on the basic understandings that could be used to develop a foundation for holistic literacy. One way to establish this foundation for primary students is by developing understandings of the science process skills using the elements and vocabulary of visual literacy.

Developing a Sense of Primary Education

At the primary level there is a heavy emphasis on reading and writing skills. This is understandable since developing these communication skills are critical. However, all too often reading and writing are emphasized to the exclusion of other subject matter (Mechling and Oliver, 1983, p. 52). In an ever more rapidly changing highly technological society students need skills that are strong in the areas of science and critical thinking skills as well. By developing understandings of the science process skills as a post reading activity teachers can provide students with opportunities to reinforce their understandings of that they read, saw, and thought during the reading experience in a fresh new way. Fostering science process skills through visual literacy, using the shared reading experience is one way to include an emphasis in the importance of books while helping the child practice skills that cross into three distinct content areas: visual literacy, science, and language arts.

During the primary years it is of key importance to develop the building block type vocabulary within many disciplines. Without a basic understanding of key vocabulary words it is impossible to express one's thoughts and ideas with others. Developing verbal communication skills through discussion is an excellent way to reinforce language acquisition before children are comfortable writing. Children's will attempt to use the verbal vocabulary in written form once their verbal skills are well developed.

At the primary level children function on the concrete level. They must have opportunities to touch, look, and explore on their own if learning is to be meaningful. They need time to gain confidence in their understandings. Vygotsky (1986) called this the zone of proximal development. Newman, Griffin, and Cole (1989) called this the construction zone. This "zone" is the learning that surrounds conceptualization of an idea . Here the learner is afforded the opportunity

to refine understandings within a safe learning environment. Children need to be actively involved in their own instruction. While the shared reading experience is passive, extending observations through hands-on activities after reading reinforces ideas brought about from the reading. This exploration also provides children time to creatively explore new ideas and viewpoints through the manipulation of tangible objects and intangible ideas.

Developing Visual Literacy

What is visual literacy? Visual literacy has many different interpretations depending upon the orientation of the writer or researcher. Perhaps for the elementary school level Braden and Hortin's definition is the most appropriate, simply because it is basic and non-threatening to the classroom teacher: "Visual literacy is (at least) the ability to understand and use images, including the ability to think, learn, and express oneself in terms of images" (1991, p. 1). This definition provides a broad zone of proximal development. For young children that wide developmental zone is ideal. Often a child's environment is so limited with regard to what is acceptable there is rarely an opportunity to stretch thinking within a safe margin. The development of visual literacy requires an understanding of the visual literacy vocabulary.

The vocabulary of visual elements can be easily understood by the primary child. It forms theinterconnecting links between other content literacies and allows students to move easily from one content area to another. It is the development of visual understandings combined with our ability to think and communicate that gives us our humanness. Within the animal kingdom many animals have highly developed visual instincts. They can see minute details that we would simply overlook. But is is the human ability to see think, and then communicate those thoughts and ideas that sets humans apart. Without developing visual acuity, critical thinking skills and a strong descriptive vocabulary educators run the risk of entrapping children with feelings they can't express. By providing them with the words and encouraging them to share their thoughts educators provide a vehicle for allowing children to explore not only their own thinking, but the thinking of others.

Building a basic visual literacy vocabulary strengthens the fundamentals that allow children to think critically and communicate with others. At the primary level children are often asked to tell what they "see" in a picture. Usually this question is followed by a description of what the child has observed. By encouraging children to discuss their observations, using a visual vocabulary, they progress toward more accurate language usage.

What visual literacy terminology would be appropriate? The vocabulary used during a discussion of the basic visual elements would be appropriate at the primary level. Dondis (1973, p. 21) provides a simple list of visual elements that teachers can easily understand and expand upon. His list of visual elements includes: line, color, shape, direction, texture, scale, and dimension. Each of these elements fits in nicely with science process skills. By using visual literacy terminology teachers and children will develop an understanding of the visual literacy language and develop ways if integrating that language into their other content areas.

Children need opportunities to explore the meanings of the visual elements. Lines can be bold or thin, straight edged or soft, solid, or dotted. Colors can affect feelings and attitudes. The selection of color by an artist may be symbolic of a deeper hidden meaning. Shapes are often discussed in the primary grades. Direction or point of view of an illustration or drawing is an important element for young children to understand. Developing an understanding of point of view may help young learners understand how manipulation of emotion can occur. Texture is a way for the artist to create a visually intriguing environment. Scale and dimension become important aspects when discussing scientific principles such as the universe or microorganisms.

Once children learn the vocabulary teachers must provide instances for students to practice using the terminology. "Visual literacy is a learner skill like writing and speaking" (Chu and Sanborn, 1991, p. 471). Far too often formal level thinking adults forget children need concrete experiences and lots of practice before they truly understand a concept. For the visual vocabulary to become part of the child's way of viewing the world it must be understood well enough to develop some transference. By providing practice through the shared reading experience using science process skills as the focal point of discussion students are required to recenter their thinking (McKim, 1972, p. 43) to communicate and manipulate their ideas.

John Stewig (cited in Chu and Sanborn, 1991, p. 473, 474, and 746) provides another aspect to developing visual literacy by discussing the importance of first evaluating the image's content, comparing and valuing it, and finally developing an appreciation or value for what one sees. Children need to discuss with their peers their perceptions regarding the pictures they see. Two observers may evaluate a picture differently while practicing a process skill exercise. Communication is something educators must foster if children are to be prepared for the world of work in the age of technology. Communication is a key element today in the world of adults. It is also a key element in science without developing the ability to communicate what has been observed or what has been researched is lost.

The Science Process Skills

The science process skills are the basic building blocks that form the core of scientific investigation. These fundamental skills tend to be attained by osmosis in most classrooms. Little is done to foster the understanding of the skill for the skill's sake. With little opportunity for practice transference doesn't take place. And yet, it is through science process skills that we gain the power to observe and make sense of life's events.

Many of the terms used to define the process skills are the same terms used within other content areas. The subtle impact of science upon all areas of study has gone largely unidentified. These skills have been referred to by Mechling and Oliver (1983, p. 45) more appropriately as "life skills." They form the fundamental core of critical thinking, literary evaluation, problem-solving, and mathematical manipulation. To place them solely within the science arena may seem too exclusive when they are so critical to life in general. However, science needs to be represented in the curriculum and all too often science is either avoided all together or taught as a highly sophisticated form of

memorization. Children need to be exposed to the elements that make scientific investigation exciting, challenging, and motivating.

The process skills for primary students are generally accepted to include the following: observation, using numbers, communication, predicting, inference, and classification.

Students practice observation across the curriculum. What they need to understand is that the process of observation is the same, it is content and vocabulary that are different. Using numbers includes counting skills and graphing. Developing the ability to distinguish objects, count them, and depict the data is crucial for the development of sound science practices. Developing communication skills is extremely important for fostering clear communication so necessary within any field of study. Prediction is used to help shape activities, scientific experiments, and hypotheses. Inference deals with proposing various reasons for occurrences. Classification skills deal with various ways to group objects.

Each of these skills has increasing levels of sophistication which can be developed once fundamental understandings are established. Each of these skills is critical to the development of basic scientific investigation techniques. Without a firm understanding of these basic building blocks to scientific research students are only following directions given by a teacher on a piece of paper. It is through the thorough understanding of these skills that students can create their own investigations and ask questions that will foster creative solutions to the problems of the present as well as the future. Research shows that children who practice reading in conjunction with process skills are better thinkers (Crocker, 1986, 141-A). Rudnitsky and Hunt (1986, p. 463) noted children who practice observing patterns increased their ability to solve problems.

A current paradigm in science education is to emphasize Science/ Technology/ Society (S/T/S). Within this framework students are encouraged to explore life problems and the way in which science technology and society share an interdependence. Yager and McCormack (1989, p. 50) presented criteria for science education including creative thinking which they consider a necessary component to this model of instruction. Medawar (1984) shares with readers the importance of creative thought for the scientist. He contends that many major scientific discoveries were brought about as the result of mental imaging and creative thought. By providing children opportunities to explore science process skills through various means the creative process is encouraged.

Visual Thinking Skills

Robert McKim (1972) among others developed the concept that visual literacy is the arena in which we develop visual thinking skills. It is through visual thinking that the visual literacy vocabulary, principles and science process skills come together.

McKim extends the discussion of visual literacy well beyond the parameters of "art evolution" into the importance of visual thinking as a springboard for critical thinking. It is through mental imaging, manipulating ideas visually in the mind, doodling and sketching ideas as they are developed that really solidifies understandings. Visual

thinking provides for the Gestalt "ah ha" understanding that serves as the enlightenment for developing ideas. Taking risks and creating unique solutions to difficult problems have historically propelled society into quantum leaps forward.

During his discussion of visual thinking McKim (1972, p. 43-48) discusses the concept of recentering one's vision. Here he sites artists, scientists and psychologists all of whom have stressed in their writings the importance of moving away from what appears to be the answer - what appears to be correct - only to find that once they've moved off center that they've discovered a more important issue or idea. This recentering of one's vision is critically important in today's world of instant assessment and quick production. Possessing the ability to look at a problem from many angles will be highly prized within the future market place. Providing the building blocks of recentering early will provide children with a tool to build knowledge bridges into the future. A learner recenters thinking when more obvious thoughts, ideas and orientations are brushed aside. When recentering has taken place the learner is freed to consider unusual ideas. By providing children the opportunity to recenter their thinking during the shared reading experience children have the opportunity to explore the process of recentering while practicing critical thinking and developing problem-solving skills.

The Shared Reading Experience

The shared reading experience using quality children's picture books is a highly regarded practice. Children have an opportunity to test their ideas, examine the thoughts of others and have their perceptions about the pleasures of reading reinforced. Regardless of age or even number of people in a room when a book is read orally something happens to the noise level ... it becomes extremely quiet! There is something inexplicable about having a book read aloud.

This experience provides children with a quiet or relaxed interactive time with literature. Often parents, grandparents or older children read orally during this time. Usually this is quiet "family" time full of feelings related to security and relaxation. This feeling can translate to the classroom as well. Teachers can provide a sense of warmth and nurturing thus providing a sense of security and comfort that may provide a safe environment for risk taking and creative thinking.

What is a Picture Book?

A picture book is a piece of literature carefully designed to incorporate text and pictures to convey the ideas of the author. "The purpose of a picture book, or any other book for that matter, is to communicate meaning" (Cullinan, 1981, p. 116). By helping children develop ways to describe what they see children are able to develop a deeper understanding of themselves.

Ironically, according to Lukens (1986, p. 27), picture books are often overlooked since the decoder is deceived into believing that a small brief book lacks substance. However pictures can provide a powerful background for telling a story. Children's picture books can be evaluated on two levels. First the book can be evaluated on its literary merit. There are quality books available that provide a rich use of descriptive language. In addition, according to Lukens

(1986, p. 26-27) books can be evaluated on visual criterion as well. It is on the visual basis that the Caldecott medal is awarded to an outstanding children's book each year.

Lacy (186, p. 16) contends that children's picture books provide the vehicle for helping children learn about life, themselves and about human nature. She contends that presenting information in as many formats as possible is crucial in helping children develop a sense of the thought processes adults take for granted.

Ideas for the Classroom

The following is a sample list of some of the ideas for blending visual literacy concepts with the development of science process skills through children's literature.

Base, Graeme. (1986). Animalia.. New York, NY: Harry N. Abrams, Incorporated.
Science: Observation and communication.
Visual Lit.: Color, pattern, texture.

Base, Graeme. (1986). The Eleventh Hour A Curious Mystery. New York, NY: Harry Abrams, Inc.
Science: Communication and observation.
Visual Lit.: Symbolism (for older children).

Ehlert, Lois. (1989). Color Zoo. New York, NY: J. B. Lippincott.
Science: Graphing.
Visual Lit.: Color and shape.

MacDonald, Suse. (1986). Alphabatics. New York, NY: Bradbury Press.
Science: Prediction and inference.
Visual Lit.: Color, line, shape, texture.

MacDonald, Suse and Oakes, Bill. (1988). Numblers. New York, NY: Dial Books for Young Readers.
Science: Prediction and inference.
Visual Lit.: Color, line, shape, texture.

Marshall, James. (1988). Goldilocks and the Three Bears. New York, NY: Dial Books for Young Readers.
Science: Classification.
Visual Lit.: Dimension.

Martin Jr., Bill and Carle, Eric. (1967). Brown Bear, Brown Bear. New York, NY: Henry Holt and Company.
Science: Graphing.
Visual Lit.: Color.

Minarik, Else Holmelund and Sendak, Maurice. (1961). Little Bear's Visit. New York, NY: Harper & Row, Publishers.
Science: Classification.
Visual Lit.: Dimension.

Sendak, Maurice, (1963). Where The Wild Things Are. New York, NY: Harper & Row, Publishers.
Science: Classification, observation, communication.
Visual Lit.: Line, pattern and texture.

Swann, Brian. (1988). A Basket Full of White Eggs. New York, NY: Orchard Books.
Science: Observation and

communication.
Visual Lit.: Line Pattern, color, shape, texture, rule of thirds.

Van Allsburg, Chris. (1979). The Garden of Abdul Gasazi. Boston, MA: Houghton Mifflin Company.
Science: Prediction and inference.
Visual Lit.: Color, line, perspective.

Van Allsburg, Chris. (1987). The Z Was Zapped.
Boston, MA: Houghton Mifflin Company.
Science: Observation communication and inference.
Visual Lit.: Color, line, texture, pattern, shape.

Summary

Educators must realize there is a new emphasis in the schools (Hassard, 1985, p. 53). The old orientation of instruction emphasized facts and concepts. The emerging orientation emphasizes "Literacy as it relates to creativity and the basic human needs and the needs of the planet's human population and survival" (Hassard, 1985, p. 53) Teachers must explore various ways of helping children develop a holistic approach to thinking and problem-solving if they are to be prepared to live in this highly technological world. By providing opportunities to integrate not only oral/aural skills but hands-on ex[eriences using vocabulary not usually associated with the reading of picture books educators have the opportunity to reinforce the perceptions yound children already have: Adults really do view the world in a holistic fashion integrating ideas from many content areas to solve a problem rather than in the fragmented and comparmentalized form that adults tend to use for instruction.

Developing visual understanding provides the texture, interest and detail to the process of developing the links that reach toward holistic literacy. Children need opportunities to build their understandings through practice in new situations that require an adaptive application.

The integrated approach to instruction provides teachers and children with opportunities to build meaningful learning links. Sharing books is a powerful instructional tool. By incorporating additional curricular information with the shared reading experience teachers are able to increase children's exposure to literature and reinforce valuable concepts that promote critical thinking and an appreciation for the highly visual world in which we live.

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